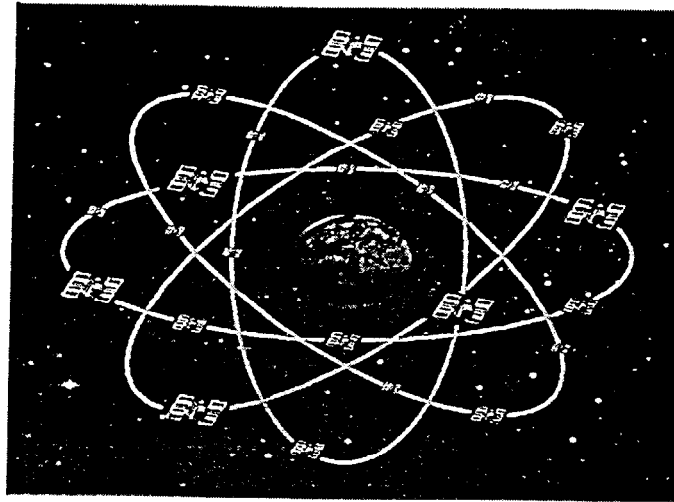


SUSTAINING A GLOBAL UTILITY



F. Michael Swiek

Executive Director

United States GPS Industry Council

GNSS/GPS

- *More than a satellite constellation*
- *More than WW navigation*
- *More than an electronics industry*
- *It is information technology*
- *It is a global utility*



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GNSS/GPS Is Information Technology

- *Evolving rapidly*
- *Evolution driven by economics*
- *Changing the way we live/work*
- *Sophistication required for stability and evolution*



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GNSS/GPS: A Global Information Utility

- *Time & position stamp for the Global Information Infrastructure*
- *Productivity driver*
- *Information tag & filter for mobile computing*
- *Infrastructure enhancer*
- *Backbone for public safety*



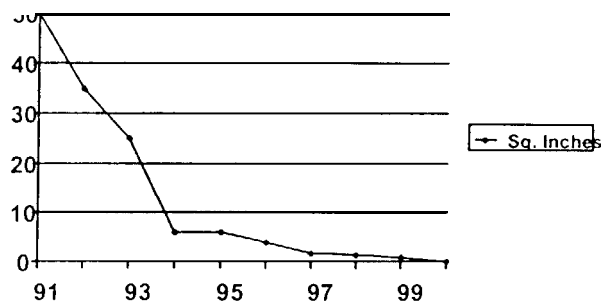
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G N S S / G P S is a S u c c e s s

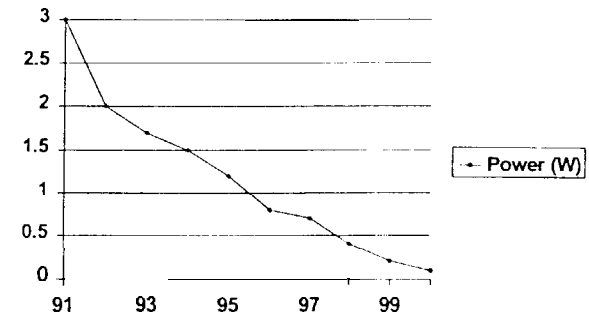
- *Dual-use technology model*
- *250K/month unit sales rate*
- *User demand driving products*
- *Stable policy needed internationally*

GPS Technology Curve

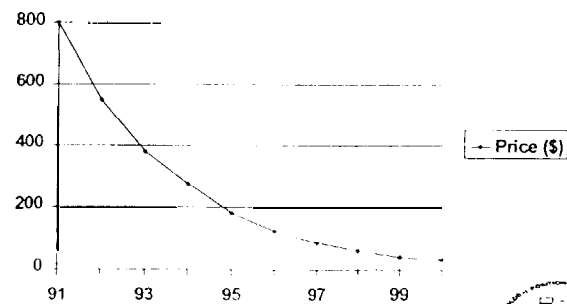
GPS PC Board Area



GPS Power Consumption



Price of GPS



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Economic Value Of The Information Is Established

Cost: Expensive ➡ Free

Accuracy: 10M ➡ 1CM

Use: Military ➡ Commercial

Technology: Exotic ➡ Component



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In 1970 Who Would Have Believed....

- *16 MIP microprocessors*
- *GHz bipolar processes*
- *.25 micron CMOS in production*
- *\$5 thumbnail size ICs*



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BASIC GPS UTILITY (DoD Responsibility)
GPS Market Projections - Worldwide
(Sales in \$millions)

U.S. GPS Industry Council (1995)

	1993	1994	1995	1996	1997	1998	1999	2000
Car Navigation	100	180	310	600	1100	2000	2500	3000
Consumer/Cellular	45	100	180	324	580	1000	1500	2250
Tracking	30	75	112	170	250	375	560	850
OEM	60	110	140	180	220	275	340	425
Survey & Mapping	100	145	201	280	364	455	546	630
GIS	25	35	50	90	160	270	410	650
Aviation	40	62	93	130	180	240	300	375
Marine	80	100	110	120	130	140	150	160
Military	30	60	70	80	90	100	110	130
	510	867	1266	1974	3074	4855	6416	8470



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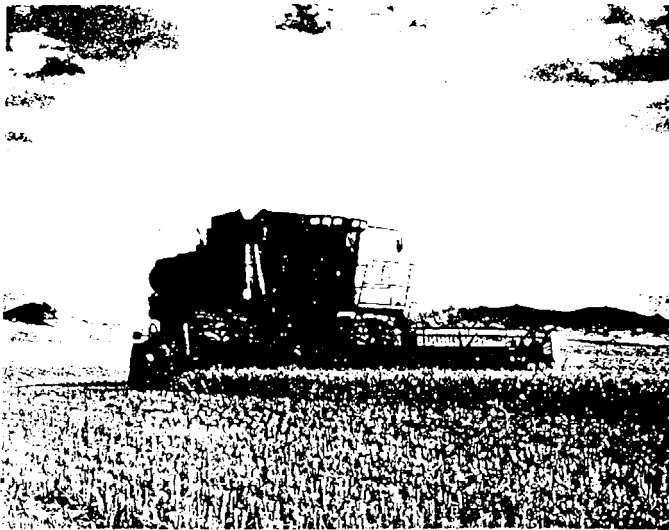
GNSS/GPS is Becoming Part of Global Infrastructure

- *Disaster response, police, fire, ambulance*
- *Coordination & tracking of commerce*
- *Survey, mapping & heavy construction*
- *Synchronization of communication nets*
- *Control & management of airspace, rivers & harbors*



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Agriculture



- *Sub-meter accuracy*
- *Machine guidance and control*
- *Precise application of fertilizer and chemicals*
- *\$20 - \$24 per acre savings*



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Construction/Civil Engineering



- ***Sub-centimeter accuracy***
- ***100-300% increase in productivity***
- ***Control survey point***
(\$10K in 1986; \$250 in 1997)



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S u r v e y



- *Intended for operation at top of Mt. Everest, 29,000 ft*
- *Measure movement of the Himalayas (6cm./year)*
- *Boston Museum of Science/TN project*



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Mining

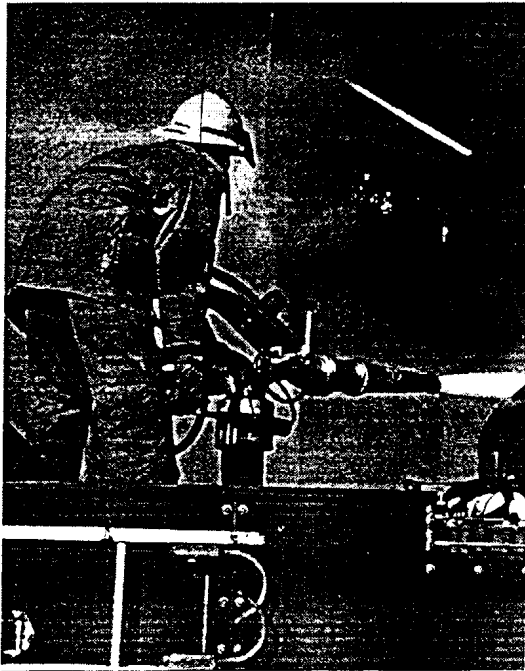


- *Open pit mining*
- *Centimeter-level accuracy*
- *Machine guidance and control*
- *Increased efficiency and safety*



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Public Safety



- *Provides rapid response and dispatch of 911 emergency services*
- *Improved response time*
- *Saves lives*



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A v i o n i c s

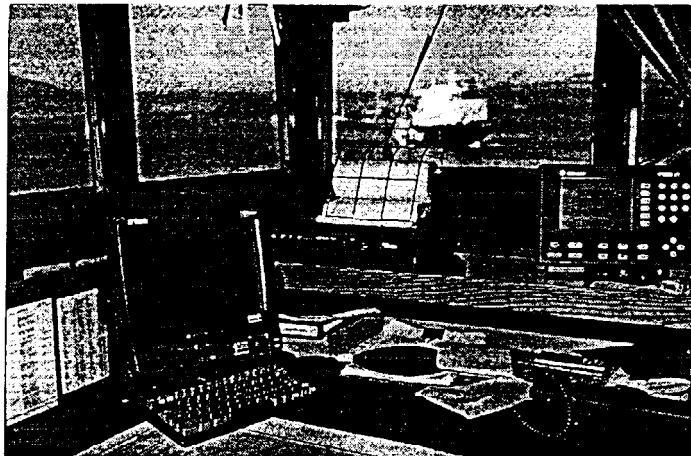


- *American Airlines*
- *Continental Airlines*
- *United Airlines*
- *Safety*
- *Fuel Savings*



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T r a c k i n g

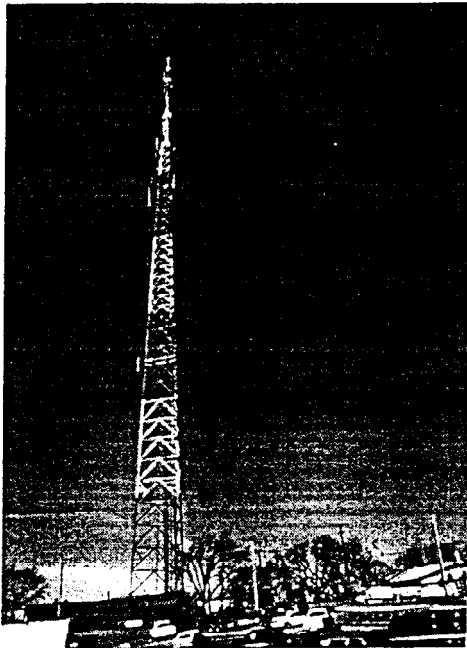


- ***Integrated safety and communication***
- ***Mandated -by International Organization (IMO)***
- ***20,000 vessels must comply by 2/99***



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T i m i n g

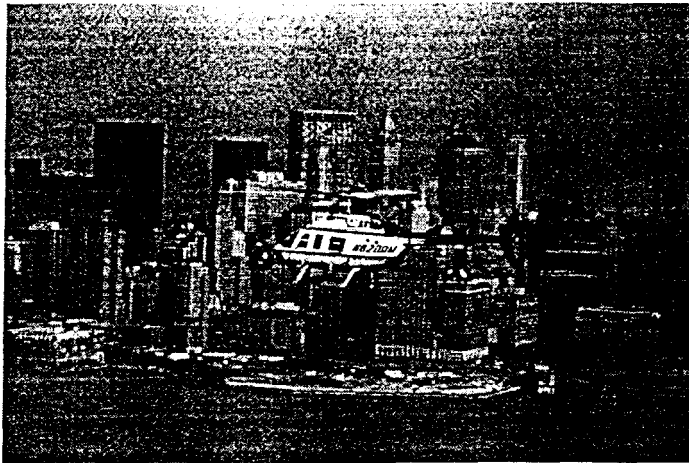


- *Precise synchronization in real-time simulcasts used in digital paging*
- *Cellular networks*
- *Investment banking transactions worldwide*
- *Video, sound, and special effects for motion pictures*



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Movies-"Daylight"



- *Spacecam's gyro-stabilized camera*
- *Centimeter-level position and timing of camera*
- *Believable background plates for special effects*



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GNSS/GPS Benefits All Regions

- *Information edge for regional security*
- *Universal uses: air & space,
land & sea*
- *Instant infrastructure*



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GNSS/GPS Availability Depends on Spectrum

- *Integrity of spectrum use serves global community*
- *Expanding global community validates efficient spectrum use*
- *Recognize success and efficiency by ensuring spectrum availability for evolution*



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Protect Global Equities In GNSS/GPS Utility

- *Preserve the ability to meet exponential demand*
- *Protect public/private strategic investments and international operations*
- *Support worldwide security and stability of the emerging GNSS/GPS*



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Proposal: Partner To Ensure The Integrity Of GNSS/GPS Spectrum

- *WRC decisions have treaty status and impact global frequency allocations and equipment standards*
- *U.S. delegation, and others, temporarily staved off intrusion into the GNSS/GPS band at WRC-97*
- *The world community has less than a year to achieve responsible results at WRC-99*



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Strategy: Prepare for WRC-99

- *Educate key WRC members*
- *Ensure that all GNSS/GPS equities are represented in the process*



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